

**Notice of Allowability**

Application No.

09/842,315

Examiner

David S Blum

Applicant(s)

ASAMI ET AL.

Art Unit

2813

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/6/04.
2. ☒ The allowed claim(s) is/are 1-15.
3. ☒ The drawings filed on 28 April 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

This action is in response to RCE filed 4/6/04 and amendment filed 3/5/04.

***Reasons for Allowance***

1. Claims 1-15 are allowed.
2. The following is an examiner's statement of reasons for allowance:

Claim 1 contains the limitations in sequence for forming a semiconductor device, a step of forming an insulating layer on a semiconductor film formed on a substrate and forming a thin oxide film on the insulating layer by applying water containing ozone.

Claim 2 contains the limitations in sequence for forming a semiconductor device, a step of forming an gate insulating layer on a crystalline semiconductor film formed on an amorphous layer over a substrate and forming a thin oxide film on the gate insulating layer by applying water containing ozone.

Claims 3, 4, 14, and 15 contain the limitations in sequence for forming a semiconductor device, a step of forming an insulating layer on a substrate and forming a thin oxide film on the insulating layer by applying water containing ozone.

Claim 13 contain the limitations in sequence for forming a semiconductor device, a step of forming an insulating layer on an insulating film on a substrate and forming a thin oxide film on the insulating layer by applying water containing ozone.

This limitation, in combination with the other limitations of claims 1-4 and 13-15 are not taught or suggested by the prior art of record. Teramoto (US005773325A) forms the layers of the instant application, but forms the thin oxide film by thermal oxidation.

Varhue (US006313017B1) teaches that the layers must be cleaned prior to subsequent processing steps and rinses with methanol and then DI water (no mention of ozone),

Lampert (US005181985A) teaches rinsing the surfaces with water containing ozone.

Although the cleaning/rinsing steps suggested by Varhue and altered by Lampert would result in a thin oxide film as in the instant application, there is no clear suggestion that if Teramoto were modified to include necessary cleaning and rinsing steps, that water with ozone would be used. It is noted that Varhue attempts to avoid the thin oxide growth (although teaching it may occur with water) and the use of ozone in the water would enhance the oxide growth. Therefore, the use of ozone in Teramoto is not certain even with the steps of cleaning/rinsing.

Claims 5-6 are allowed as being properly dependent upon allowed claim 1.

Claims 7-8 are allowed as being properly dependent upon allowed claim 2.

Claims 9-10 are allowed as being properly dependent upon allowed claim 3.

Claims 11-12 are allowed as being properly dependent upon allowed claim 4.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (757)-272-1687) and e-mail address is David.blum@USPTO.gov .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr., can be reached at (571)-272-1702. Our facsimile number all patent correspondence to be entered into an application is (703) 872-9306. The facsimile number for customer service is (703)-872-9317.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David S. Blum  
April 15, 2004

*C. Chaudhari*  
**Chandra Chaudhari**  
**Primary Examiner**